

Terrestrial Animal Health Standards Commission Report September 2016

DRAFT CHAPTER 7.X.

ANIMAL WELFARE AND PIG PRODUCTION SYSTEMS

Article 7.X.1.

Definitions

Pig production systems are defined as all commercial systems in which the purpose of the operation includes some or all of the breeding, rearing and management of pigs intended for production of *meat*.

For the purpose of this chapter management is defined at the farm management level and at the *animal handler* level. At the level of farm management, human resources management practices including selection and training, and animal management practices, such as best practice in housing and husbandry and implementation of welfare protocol and audits all impact on *animal welfare*.

At the *animal handler* level this requires a range of well-developed husbandry skills and knowledge to care for animals.

For the purpose of this chapter environmental enrichment: means increasing the complexity (e.g. foraging opportunities, social housing, etc.) of the animal's environment to foster the expression of normal behaviour and reduce the expression of abnormal behaviour and provide cognitive stimulation. The endpoint of enrichment should be to improve the biological functioning of the animal (Newberry, 1995).

Article 7.X.2.

Scope

This chapter addresses the welfare aspects of pig production systems. However, *captive wild* pigs are not considered.

Article 7.X.3.

Commercial pig production systems

Commercial pig production systems include:

1. Indoors

These are systems in which pigs are kept indoors, and are fully dependent on humans to provide for basic animal needs such as food and water. The type of housing depends on the environment, climatic conditions and management system. The animals may be kept in groups or individually.

2. Outdoors

These are systems in which pigs live outdoors with shelter or shade, have some autonomy over access to shelter or shade, and may be fully dependent on humans to provide for basic animal needs such as food and water. They are typically confined in paddocks according to their production stage.

3. Combination systems

These are systems in which pigs are managed in any combination of indoor and outdoor production systems, depending on weather or production stage.

Article 7.X.4.

Criteria (or measurables) for the welfare of pigs

The following outcome-based criteria, specifically animal-based criteria, can be useful indicators of *animal welfare*. The use of these indicators and their appropriate thresholds should be adapted to the different situations in which pigs are managed. Consideration should also be given to the design of the systems. These criteria can be considered as a tool to monitor the efficiency of design and management, given that both of these can affect *animal welfare*.

1. Behaviour

Certain behaviours could indicate an *animal welfare* problem. These include changes of feed and water intake, altered locomotory behaviour and posture, altered lying time, altered respiratory rate and panting, coughing, shivering and huddling, increased agonistic behaviours and stereotypic, apathetic or other abnormal behaviours (e.g. tail biting).

Stereotypy is defined as a sequence of invariant motor acts, which provide no obvious gain or purpose for the animal. Some stereotypies commonly observed in pigs include sham chewing, tongue rolling, teeth grinding, bar biting and floor licking.

2. Morbidity rates

Infectious and metabolic diseases, lameness, peri-partum and post-procedural complications, injury and other forms of morbidity, above recognised thresholds, may be direct or indirect indicators of the *animal welfare* status of the whole *herd*. Understanding the aetiology of the disease or syndrome is important for detecting potential *animal welfare* problems. Mastitis and metritis, leg and hoof, and reproductive diseases are also particularly important animal health problems for pigs. Scoring systems, such as for body condition, lameness and injuries, can provide additional information.

Both clinical examination and pathology should be utilised as indicators of disease, injuries and other problems that may compromise *animal welfare*.

3. Mortality and culling rates

Mortality and culling rates affect the length of productive life and, like morbidity rates, may be direct or indirect indicators of the *animal welfare* status. Depending on the production system, estimates of mortality and culling rates can be obtained by analysing the causes of *death* and culling and their temporal and spatial patterns of occurrence. Mortality and culling rates, and their causes, when known, should be recorded regularly, e.g. daily, and used for monitoring e.g. monthly, annually.

Necropsy is useful in establishing the cause of *death*.

4. Changes in body weight and body condition

In growing animals, body weight changes outside the expected growth rate, especially excessive sudden loss, are indicators of poor *animal welfare* and health.

In mature animals, body condition outside an acceptable range may be an indicator of compromised *animal welfare*, health and reproductive efficiency.

5. Reproductive efficiency

Reproductive efficiency can be an indicator of *animal welfare* and health status. Future performance of sows or gilts can be affected by under- or over-nutrition at different stages of rearing. Poor reproductive performance, compared with the targets expected for a particular breed or hybrid, can indicate *animal welfare* problems.

Examples may include:

- low conception rates,
- high abortion rates,
- metritis and mastitis,
- low litter size,
- low numbers born alive,
- high numbers of stillborns or mummies.

6. Physical appearance

Physical appearance may be an indicator of *animal welfare* and health. Attributes of physical appearance that may indicate compromised welfare include:

- presence of ectoparasites,
- abnormal texture or hair loss,
- excessive soiling with faeces in indoor systems,
- swellings, injuries or lesions,
- discharges (e.g. from nose or eyes),
- feet and leg abnormalities,
- abnormal posture (e.g. rounded back, head low),
- emaciation or dehydration.

7. Handling response

Improper handling can result in fear and distress in pigs. Fear of humans may be an indicator of poor *animal welfare* and health. Indicators include:

- evidence of poor human-animal relationship, such as disturbed behaviour when being moved or when *animal handlers* enter a pen,
- animals slipping or falling during handling,
- injuries sustained during handling, such as bruising, lacerations and fractured legs,
- animals vocalising abnormally or excessively during restraint and handling.

8. Lameness

Pigs are susceptible to a variety of infectious and non-infectious musculoskeletal disorders. These disorders may lead to lameness and to gait abnormalities. Pigs that are lame or have gait abnormalities may have difficulty reaching food and water and may experience pain. Musculoskeletal problems have many causes, including genetic, nutrition, sanitation, floor quality, and other environmental and management factors. There are several gait scoring systems available.

9. Complications from common procedures

Some procedures such as surgical castration, tail docking, teeth clipping or grinding, tusk trimming, identification, nose ringing and hoof care are commonly performed in pigs to facilitate management, to meet market requirements and improve human safety and *animal welfare*.

However, if these procedures are not performed properly, *animal welfare* and health can be compromised.

Indicators of such problems could include:

- post-procedure *infection* and swelling,
- post-procedure lameness,
- behaviour indicating pain, fear and distress,
- morbidity, mortality and culling rates,
- reduced feed and water intake,
- post procedure body condition and weight loss.

Article 7.X.5.

Recommendations

Ensuring good welfare of pigs is contingent on several management factors, including system design, environmental management, and animal management practices which include responsible husbandry and provision of appropriate care. Serious problems can arise in any system if one or more of these elements are lacking.

Articles 7.X.6. to 7.X.X. provide recommendations for measures applied to pigs.

Each recommendation includes a list of relevant outcome-based measurables derived from Article 7.X.4.

This does not exclude other measures being used where or when appropriate.

Article 7.X.6.

Housing

When new facilities are planned or existing facilities are modified, professional advice on design in regards to *animal welfare* and health should be sought.

Housing systems and their components should be designed, constructed and regularly inspected and maintained in a manner that reduces the risk of injury, *disease* or stress for pigs. Facilities should to allow for the safe, efficient and humane management and movement of pigs.

There should be a separate area where sick and injured animals can be treated and monitored. When a separated space is provided, this should accommodate all the needs of the animal e.g. recumbent or lame animals or animals with severe wounds may require additional bedding or an alternative floor surface.

Pigs should not be tethered as part of their normal housing systems.

Good *animal welfare* outcomes can be achieved in a range of housing systems. The design and management of the system are critical for achieving good *animal welfare* and health outcomes.

Pigs are social animals and prefer living in groups, therefore housing systems where pregnant sows and gilts can be kept in groups are recommended.

Outcome-based criteria (or measurables): physical appearance (injuries), behaviour, changes in body weight and body condition, handling response, reproductive efficiency, lameness and morbidity, mortality and culling rates.

Article 7.X.7.

Personnel training

Pigs should be cared for by a sufficient number of personnel, who collectively possess the ability, knowledge and competence necessary to maintain the welfare and health of the animals.

All people responsible for pigs should be competent through formal training or practical experience in accordance with their responsibilities. This includes understanding of and skill in animal handling, nutrition, reproductive management techniques, behaviour, *biosecurity*, signs of *disease*, and indicators of poor *animal welfare* such as stress, pain and discomfort, and their alleviation.

Outcome-based criteria (or measurables): handling response, physical appearance, behaviour, changes in body weight, body condition, reproductive efficiency, lameness and morbidity, mortality and culling rates.

Article 7.X.8.

Handling and inspection

Pigs should be inspected at least once a day when fully dependent on humans to provide for basic needs such as food and water and to identify welfare and health problems.

Some animals should be inspected more frequently, for example, farrowing sows, new born piglets, newly weaned pigs and newly-mixed gilts and sows.

Pigs identified as sick or injured should be given appropriate treatment at the first available opportunity by competent *animal handlers*. If *animal handlers* are unable to provide appropriate treatment, the services of a *veterinarian* should be sought.

Recommendations on the handling of pigs are also found in Chapter 7.3. In particular handling aids that may cause pain and distress (e.g. electric goads) should be used only in extreme circumstances and provided that the animal can move freely. The use of electric prods should be avoided (see also point 3 of Article 7.3.8.), and in any case should not be used in sensitive areas including the udder, face, eyes, nose or ano-genital region.

Exposure of pigs to sudden movement or changes in visual contrasts should be minimised where possible to prevent stress and fear reactions. Pigs should not be handled aggressively (e.g. kicked, walked on top of, held or pulled by one front leg, ears or tail). Pigs that become distressed during handling should be attended to immediately.

Pigs should be restrained only for as long as necessary and only appropriate, well-maintained restraint devices should be used.

Outcome-based criteria (or measurables): physical appearance, behaviour, changes in body weight and body condition, handling response, reproductive efficiency, lameness and morbidity, mortality and culling rates.

Article 7.X.9.

Painful procedures

Some procedures such as surgical castration, tail docking, teeth clipping or grinding, tusk trimming, identification, and nose ringing are commonly performed in pigs. These procedures should only be performed to facilitate management, to meet market requirements and improve human safety and *animal welfare*.

These procedures have the potential to cause pain and thus should be performed in such a way as to minimise any pain and distress to the animal.

Options for enhancing *animal welfare* in relation to these procedures include the internationally recognised 'three Rs' which involves replacement (entire or immunocastrated males vs. castrated males), reduction (tail docking and teeth clipping only when necessary) and refinement (providing analgesia or anaesthesia).

Outcome-based criteria (or measurables): complications from common procedures, morbidity rates, mortality and culling rates, abnormal behaviour, physical appearance and changes in weight and body condition.

Article 7.X.10.

Feeding and watering of animals

The amount of feed and nutrients pigs require in any management system is affected by factors such as climate, the nutritional composition and quality of the diet, the age, gender, size and physiological state of the pigs (e.g. pregnancy, lactation), and their state of health, growth rate, previous feeding levels and level of activity and exercise.

All pigs should receive adequate quantities of feed and nutrients each day to enable each pig to:

- maintain good health;
- meet its physiological demands; and
- avoid metabolic and nutritional disorders.

Feed and water should be provided in such a way as to prevent undue competition and injury.

Pigs should be fed a diet with sufficient fibrous feedstuffs in order to reduce as much as possible the occurrence of gastric ulcers (Hedde *et al.*, 1985).

All pigs should have access to an adequate supply of palatable water at a temperature that does not inhibit drinking and that meets their physiological requirements and is free from contaminants hazardous to pig health (Patience, 2013).

Outcome-based criteria (or measurables): changes in body weight and body condition, agonistic behaviour at feeding and watering places and abnormal behaviour such as tail biting, mortality and culling rates, and morbidity rates (gastric ulcers).

Article 7.X.11.

Environmental enrichment

Animals should be provided with an environment that provides complexity and cognitive stimulation (e.g. foraging opportunities, social housing, etc.) to foster normal behaviour, reduce abnormal behaviour and improve biological function.

Pigs should be provided with multiple forms of enrichment that aim to improve the welfare of the animals through the enhancement of their physical and social environments, such as:

- sufficient quantity of suitable materials to enable pigs to fulfil their innate needs to look for feed (edible materials), bite (chewable materials), root (investigable materials) and manipulate (manipulable materials) (Bracke *et al.*, 2006);
- social enrichment which involves either keeping pigs in groups or individually with visual, olfactory and auditory contact with other pigs;
- positive human contact (such as pats, rubs and talking).

Outcome-based criteria (or measurables): physical appearance (injuries), behaviour (stereotypies, tail biting), changes in body weight and body condition, handling response, reproductive efficiency, lameness and morbidity, mortality and culling rates.

Article 7.X.12.

Prevention of abnormal behaviour

In pig production there are a number of abnormal behaviours that can be prevented or minimised with management procedures.

Many of these problems are multifactorial and minimising their occurrence requires an examination of the whole environment and of several management factors. However some recommendations to reduce their occurrence include:

- 1) Oral stereotypies (e.g. bar biting, sham chewing, excessive drinking) in adult pigs can be minimised by providing environmental enrichment and increasing feeding time and satiety by increasing fibre content in the diet or foraging roughage (Robert *et al.*, 1997; Bergeron *et al.*, 2000).
- 2) Tail biting may be reduced by providing an adequate enrichment material and an adequate diet (avoiding deficiencies of sodium or essential amino-acids), and avoiding high stocking densities and competition for feed and water (Walker and Bilkei, 2005). Other factors to consider include animal characteristics (breed, genetics, gender) and social environment (herd size, mixing animals) (Schroder-Petersen and Simonsen, 2001; EFSA, 2007; Taylor *et al.*, 2010).
- 3) Belly nosing and ear sucking may be reduced by increasing the weaning age, and providing feed to piglets prior to weaning to avoid the abrupt change of feed (Marchant-Forde, 2009; Sybesma, 1981; Worobec, 1999).
- 4) Vulva biting may be reduced by minimising competition in accessing the feeding area (Bench *et al.*, 2013; Leeb *et al.*, 2001; Rizvi *et al.*, 1998).

Outcome-based criteria (or measurable): physical appearance (injuries), behaviour (abnormal behaviour), morbidity rates, mortality and culling rates, reproductive efficiency and changes in body weight and body condition.

Article 7.X.13.

Space allowance

Space allowance should be managed taking into account different areas for lying, standing and feeding. Crowding should not adversely affect normal behaviour of pigs and durations of time spent lying.

Insufficient and inadequate space allowance may increase stress, the occurrence of injuries and have an adverse effect on growth rate, feed efficiency, reproduction and behaviour such as locomotion, resting, feeding and drinking, agonistic and abnormal behaviour (Gonyou *et al.*, 2006; Ekkel, 2003; Turner, 2000).

1. Group housing

Floor space may interact with a number of factors such as temperature, humidity, floor type and feeding systems (Marchant-Forde, 2009; Verdon, 2015). All pigs should be able to rest simultaneously, and each animal lie down, stand up and move freely. Sufficient space should be provided to enable animals to have access to feed, water, to separate lying and elimination areas and to avoid aggressive animals.

If abnormal behaviour is seen, corrective measures should be taken, such as increasing space allowance and providing barriers where possible.

In outdoor systems where pigs have autonomy over diet selection, stocking density should be matched to the available feed supply.

Outcome-based criteria (or measurables): reduction or variation in body weight and body condition, increasing agonistic and abnormal behaviour such as tail biting, injuries, morbidity, mortality and culling rates, and physical appearance (e.g. presence of faeces on the skin).

2. Individual pens

Pigs must be provided with sufficient space so that they can stand up, turn around and lie comfortably in a natural position, and that provides for separation of dunging, lying and eating areas.

Outcome-based criteria (or measurables): increasing abnormal behaviour (stereotypies), morbidity, mortality and culling rates, and physical appearance (e.g. presence of faeces on the skin, injuries).

3. Stalls (crates)

Stalls must be sized appropriately to allow pigs to:

- be able to stand up in their natural stance without contact with either side of the stall,
- stand up without touching the top bars,
- stand in a stall without simultaneously touching both ends of the stall,
- lie comfortably on their sides without disturbing neighbouring pigs.

Outcome-based criteria (or measurables): physical appearance (e.g. injuries), increasing abnormal behaviour (stereotypies), reproductive efficiency, lameness and morbidity, mortality and culling rates (e.g. piglets).

Article 7.X.14.

Flooring, bedding, resting surfaces

In all production systems pigs need a well-drained and comfortable place to rest.

Floor management in indoor production systems can have a significant impact on pig welfare (Temple *et al.*, 2012; Newton *et al.*, 1980). Flooring, bedding, resting surfaces and outdoor yards should be cleaned as conditions warrant, to ensure good hygiene, comfort and minimise risk of diseases and injuries. Areas with excessive faecal accumulation are not suitable for resting.

Floors should be designed to minimise slipping and falling, promote foot health, and reduce the risk of claw injuries.

If a housing system includes areas of slatted floor, the slat and gap widths should be appropriate to the claw size of the pigs to prevent injuries.

Slopes of the pens should allow water to drain and not pool in the pens.

In outdoor systems, pigs should be rotated between paddocks to ensure good hygiene and minimise risk of diseases.

If bedding is provided it should be suitable (e.g. hygienic, non-toxic) and maintained to provide pigs with a clean, dry and comfortable place on which to lie.

Outcome-based criteria (or measurables): physical appearance (e.g. injuries, presence of faeces on the skin, bursitis), lameness and morbidity rates (e.g. respiratory disorders, reproductive tract infections).

Article 7.X.15.

Air quality

Good air quality and ventilation are important for the welfare and health of pigs and reduce the risk of respiratory discomfort and diseases. Dust, micro-organisms and noxious gases, including ammonia, hydrogen sulphide, and methane, can be problematic in indoor systems due to decomposing animal waste (Drummond *et al.*, 1980).

Air quality is influenced strongly by management and building design in housed systems. Air composition is influenced by stocking density, the size of the pigs, flooring, bedding, waste management, building design and ventilation system (Ni *et al.*, 1999).

Proper ventilation is important for effective heat dissipation in pigs and to prevent the build-up of effluent gases (e.g. ammonia and hydrogen sulphide), including those from manure and dust in the housing unit. The ammonia level in enclosed housing should not exceed 25 ppm. A useful indicator is that if air quality is unpleasant for humans it is also likely to be a problem for pigs.

Outcome-based criteria (or measurables): morbidity, mortality and culling rates, behaviour (especially respiratory rate or coughing), reductions in weight and body condition.

Article 7.X.16.

Thermal environment

Although pigs can adapt to different thermal environments particularly if appropriate breeds are used for the anticipated conditions, sudden fluctuations in temperature can cause heat or cold stress.

1. Heat stress

Heat stress is a serious problem in pig production. It can cause significant reductions in weight gain and fertility, or sudden death (Werremann and Bazer, 1985).

The risk of heat stress for pigs is influenced by environmental factors including air temperature, relative humidity, wind speed, stocking density, shade and wallow availability in outdoor systems, animal factors including breed, age and body condition (Heitman and Hughes, 1949; Quiniou and Noblet, 1999).

Animal handlers should be aware of the risk that heat stress poses to pigs and of the thresholds in relation to heat and humidity that may require action. If the risk of heat stress reaches very high levels the *animal handlers* should institute an emergency action plan that gives priority to access to additional water and could include provision of shade and wallows in outdoor systems, fans, reduction of stocking density and provision of cooling systems as appropriate for the local conditions.

Outcome-based criteria (or measurables): behaviour (feed and water intake, respiratory rate, panting, agonistic behaviour), physical appearance (presence of faeces on the skin), morbidity, mortality and culling rates, and reproductive efficiency.

2. Cold stress

Protection from cold should be provided when these conditions are likely to create a serious risk to the welfare of pigs, particularly in neonates and young pigs and others that are physiologically compromised (e.g. ill animals). This could be provided by extra bedding, heat mats or lamps and natural or man-made shelters in outdoor systems (Blecha and Kelley, 1981).

Outcome-based criteria (or measurables): morbidity, mortality and culling rates, physical appearance (long hair, piloerection), behaviour (especially abnormal postures, shivering and huddling) and changes in body weight and body condition.

Article 7.X.17.

Noise

Pigs are adaptable to different levels and types of noise. However, exposure of pigs to sudden or loud noises should be minimised where possible to prevent stress and fear reactions. Ventilation fans, feeding machinery or other indoor or outdoor equipment should be constructed, placed, operated and maintained in such a way that they cause the least possible amount of noise (Algers and Jensen, 1991).

Outcome-based criteria (or measurables): behaviour (e.g. fleeing and vocalisation), physical appearance (e.g. injuries), reproductive efficiency, changes in body weight and body condition.

Article 7.X.18.

Lighting

Indoor systems should have light levels sufficient to allow all pigs to see one another, to investigate their surroundings visually and to show other normal behaviour patterns and to be seen clearly by staff to allow adequate inspection of the pigs. The lighting regime shall be such as to prevent health and behavioural problems. It should follow a 24-hour rhythm and include sufficient uninterrupted dark and light periods, preferably no less than 6 hours for both.

A minimum of 40 lux of lighting is recommended for a minimum of 6 hours per day (Martelli *et al.*, 2005; Taylor *et al.*, 2006).

Artificial light sources should be located so as not to cause discomfort to the pigs.

Outcome-based criteria (or measurable): behaviour (locomotive behaviour), morbidity rates, reproductive efficiency, physical appearance (injuries) and changes in body weight and body condition.

Article 7.X.19.

Farrowing and lactation

Sows and gilts need time to adjust to their farrowing accommodation before farrowing. Nesting material should be provided where possible some days before farrowing (Yun *et al.*, 2014). Sows should be observed frequently around their expected farrowing times. As some sows and gilts need assistance during farrowing sufficient space and competent staff are needed.

Outcome-based criteria (or measurables): mortality and culling rates (piglets), morbidity rates (metritis and mastitis), behaviour (stereotypies), reproductive efficiency, physical appearance (injuries).

Article 7.X.20.

Weaning

Weaning can be a stressful time for sows and piglets and good management is required. Problems associated with weaning are generally related to the piglet's size and physiological maturity. Early weaning systems require good management and nutrition of the piglets.

An average weaning age of three weeks or older is recommended (Worobec *et al.*, 1999).

Regardless of age, low weight piglets require additional care and can benefit from being kept in small groups in specialised pens until they are able to be moved to the common nursery area.

Newly weaned pigs are susceptible to disease challenges, so adherence to high-level hygiene protocols is important. It should be ensured that the area that piglets are weaned into is clean and dry.

All newly weaned pigs should be monitored during the first two weeks after weaning for any signs of ill-health.

Outcome-based criteria (or measurable): mortality and culling rates (piglets), morbidity rates (respiratory disease, diarrhoea), behaviour (belly nosing and ear sucking), physical appearance (injuries) and changes in body weight and body condition.

Article 7.X.21.

Mixing

Mixing of unfamiliar pigs can result in fighting to establish a dominance hierarchy, and therefore mixing should be minimised as much as possible (Moore *et al.*, 1994; Fabrega *et al.*, 2013). When mixing, strategies to reduce aggression and injuries should be implemented and animals should be supervised.

Measures to prevent excessive fighting and injuries could include (Arey and Edwards, 1998):

- providing additional space and a non-slippery floor,
- feeding before mixing,
- feed on the floor in the mixing area,
- provision of straw in the mixing area,

- providing opportunities to escape and to hide from other pigs, such as visual barriers,
- mix previously familiarised animals whenever possible,
- young animals should be mixed as soon after weaning as possible,
- avoid adding one or small number of animals to a large established group.

Outcome-based criteria (or measurables): mortality, morbidity and culling rates, behaviour (agonistic), physical appearance (injuries), changes in body weight and body condition and reproductive efficiency.

Article 7.X.22.

Genetic selection

Welfare and health considerations should balance any decisions on productivity and growth rate when choosing a breed or hybrid for a particular location or production system.

Selective breeding can improve the welfare of pigs for example by selection to improve maternal behaviour, piglet viability, temperament and resistance to stress and disease and to reduce tail biting and aggressive behaviour (Turner *et al.*, 2006).

Outcome-based criteria (or measurable): physical appearance, behaviour, changes in body weight and body condition, handling response, reproductive efficiency, lameness, and morbidity, mortality and culling rates.

Article 7.X.23.

Protection from predators

In outdoor and combination systems pigs should be protected from predators.

Outcome-based criteria (or measurable): morbidity, mortality and culling rates, behaviour, and physical appearance (injuries).

Article 7.X.24.

Biosecurity and animal health

1. Biosecurity and disease prevention

Biosecurity plans should be designed, implemented and maintained, commensurate with the best possible *herd* health status, available resources and infrastructure, and current disease risk and, for *listed diseases* in accordance with relevant recommendations in the *Terrestrial Code*.

These *biosecurity plans* should address the control of the major sources and pathways for spread of pathogens:

- pigs, including introductions to the *herd*,
- young animals coming from different sources,
- other domestic animals, *wildlife*, and pests,
- people, including sanitation practices,
- equipment, tools and facilities,
- *vehicles*,
- air,
- water supply, feed and bedding,
- manure, waste and disposal of dead animals,
- semen.

Outcome-based criteria (or measurables): morbidity, mortality and culling rates, reproductive efficiency, changes in weight and body condition, physical appearance (signs of disease).

a) Animal health management

Animal health management should optimise the physical and behavioural health and welfare of the pig herd. It includes the prevention, treatment and control of *diseases* and conditions affecting the *herd* (in particular respiratory, reproductive and enteric diseases).

There should be an effective programme for the prevention and treatment of *diseases* and conditions, formulated in consultation with a *veterinarian*, where appropriate. This programme should include the recording of production data (e.g. number of sows, piglets per sow per year, feed conversion, and body weight at weaning), morbidity, mortality and culling rate and medical treatments. It should be kept up to date by the *animal handler*. Regular monitoring of records aids management and quickly reveals problem areas for intervention.

For parasitic burdens (e.g. endoparasites, ectoparasites and protozoa), a programme should be implemented to monitor, control and treat, as appropriate.

Lameness can be a problem in pigs. *Animal handlers* should monitor the state of feet and legs and take measures to prevent lameness and maintain foot and leg health.

Those responsible for the care of pigs should be aware of early specific signs of *disease* or distress (e.g. coughing, abortion, diarrhoea, changes in locomotory behaviour, apathetic behaviour), and non-specific signs such as reduced feed and water intake, changes in weight and body condition, changes in behaviour or abnormal physical appearance.

Pigs at higher risk of *disease* or distress will require more frequent inspection by *animal handlers*. If *animal handlers* suspect the presence of a *disease* or are not able to correct the causes of *disease* or distress, they should seek advice from those having training and experience, such as *veterinarians* or other qualified advisers, as appropriate.

Non-ambulatory pigs should not be transported or moved unless absolutely necessary for treatment or diagnosis. Such movements should be done carefully using methods that avoid dragging the animal or lifting it in a way that might exacerbate injuries.

Animal handlers should also be competent in assessing fitness to transport, as described in Chapter 7.3.

In case of *disease* or injury, when treatment has failed or recovery is unlikely (e.g. pigs that are unable to stand up, unaided or refuse to eat or drink), the animal should be humanely killed as soon as possible in accordance with Chapter 7.6.

Outcome-based criteria (or measurable): morbidity, mortality and culling rates, reproductive efficiency, behaviour (apathetic behaviour), lameness, physical appearance (injuries) and changes in body weight and body condition.

b) Emergency plans for disease outbreaks

Emergency plans should cover the management of the farm in the event of an emergency disease outbreak, consistent with national programmes and recommendations of *Veterinary Services* as appropriate.

Article 7.X.25.

Emergency plans

Where the failure of power, water and feed supply systems could compromise *animal welfare*, pig producers should have contingency plans to cover the failure of these systems. These plans may include the provision of fail-safe alarms to detect malfunctions, back-up generators, contact information for key service providers, ability to store water on farm, access to water cartage services, adequate on-farm storage of feed and an alternative feed supply.

Preventive measures for emergencies should be input-based rather than outcome-based. Contingency plans should be documented and communicated to all responsible parties. Alarms and back-up systems should be checked regularly.

Article 7.X.26.

Disaster management

Plans should be in place to minimise and mitigate the effect of disasters (e.g. earthquake, fire, flooding, blizzard and hurricane). Such plans may include evacuation procedures, identifying high ground, maintaining emergency feed and water stores, destocking and humane *killing* when necessary.

Humane *killing* procedures for sick or injured pigs should be part of the disaster management plan.

Reference to emergency plans can also be found in Article 7.X.25.

Article 7.X.27.

Euthanasia (Humane killing)

Allowing a sick or injured animal to linger unnecessarily is unacceptable. Therefore, for sick and injured pigs a prompt diagnosis should be made to determine whether the animal should be treated or humanely killed.

The decision to kill an animal humanely and the procedure itself should be undertaken by a competent person.

Reasons for humane *killing* may include:

- severe emaciation, weak pigs that are non-ambulatory or at risk of becoming non-ambulatory,
- non-ambulatory pigs that will not stand up, refuse to eat or drink, have not responded to therapy,
- rapid deterioration of a medical condition for which therapies have been unsuccessful,
- severe, debilitating pain,
- compound fracture,
- spinal injury,
- central nervous system *disease*,
- multiple joint *infections* with chronic weight loss,
- piglets that are premature and unlikely to survive, or have a debilitating congenital defect, and
- as part of disaster management response.

For a description of acceptable methods for humane *killing* of pigs see Chapter 7.6.

Scientific references

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